

Title of the abstract: Morphological study of an undescribed additional head of Quadriceps femoris – a cadaveric and radiological study

Department: Department of Anatomy

Name of the candidate: Femina Sam J P

Degree and subject: M.D in Anatomy

Name of the guide: Suganthi Rabi

Background: The quadriceps femoris (QF) consists of rectus femoris and the three vasti. Recently, an additional muscle head of QF was described. But the description and knowledge regarding the attachments, variability and morphometry of the additional muscle head of the quadriceps femoris is lacking in South Indian population.

Aim: To confirm the presence of an undescribed additional head of quadriceps femoris by anatomical dissection and radiological techniques

Objectives:

Cadaveric study

- To locate the attachments of the additional head of quadriceps femoris muscle
- To describe the morphology of the additional head
- To study the motor innervation pattern and vascular supply of the additional muscle head

Radiological study

- To study the incidence of the additional head of quadriceps in MRI

Materials and Methods: Ethical approval was obtained from the institutional review board. Forty one human lower limbs were dissected to sought out the presence of the additional muscle head of QF by retracting the vastus lateralis laterally. Branches of the femoral artery and femoral nerve supplying the additional muscle head were traced. The anatomy of the additional muscle head, if present, was studied with respect to its location, origin, its aponeurosis and neurovascular bundle. Retrospective analysis of 102 MR images of the patients was done. Since fourteen MR images were used for pilot study, the data was analysed for 88 MR images. As the additional muscle head of quadriceps femoris was not reported earlier using MR imaging, high resolution MRI scan was done on 12 cadaveric lower limbs to look for the presence of the additional head of quadriceps femoris and followed by anatomical dissection to confirm its presence or absence.

Data was entered in Microsoft excel and statistical analysis was performed using STATA V.13.1. Descriptive analysis was done to find out mean, median and standard deviation of the variables. Fisher's exact test was done to find out whether there were any gender differences in the incidence of additional muscle head in cadavers. Pearson Chi-square test was done to find out whether there is any significant difference between the right and left side of the cadaver.

Results: The additional muscle head was present in 43.9 % of the lower limbs and was constantly located in between the vastus lateralis and the vastus intermedius. It inserted either as a muscle belly or as an aponeurosis into vastus lateralis (22.22%) or vastus intermedius (55.56 %) or directly into the base of patella. There was no gender discrimination in the length, breadth and thickness of the additional muscle head. The additional muscle head received its vascular supply from the lateral circumflex femoral artery and was innervated by the femoral nerve. The incidence of the additional head of QF analyzed by MR imaging was 30.68 %. The cadaveric MRI showed 100% concordance rate.

Conclusion: This study demonstrated the presence of additional muscle head of quadriceps femoris - 43.9 % by cadaveric dissection and 30.68 % by radiological techniques.